



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,809	04/30/2001	George Barbastathis	MIT8462	3209
7590	09/02/2004		EXAMINER	
Samuels, Gauthier & Stevens, LLP			HANNETT, JAMES M	
Attn: Matthew E. Connors			ART UNIT	PAPER NUMBER
Suite 3300			2612	
225 Franklin Street				
Boston, MA 02110				
DATE MAILED: 09/02/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/845,809	BARBASTATHIS ET AL. <i>[Signature]</i>
	Examiner	Art Unit
	James M Hannett	2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 30 April 2001.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 April 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2 and 5</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Several of the figures have hand drawn reference characters.

Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings.

The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Imaging system wherein a spatial light modulator is used for selectively modulating the input image.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 2612

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 1: Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
- 2: Claim 7 recites the limitation "said liquid crystal cell". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 3: Claims 1-7, 10, 12, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 5,991,551 Bacs, Jr. et al.
- 4: As for Claim 1, Bacs, Jr. et al teaches on Column 10, Lines 33-67 and Column 11, Lines 1-4 and depicts in Figures (1 and 8) an imaging system for receiving images, the system comprising: an image receiving unit (22) for receiving an input image; and a spatial light modulator (90) interposed between the image receiving unit (22) and an input image (26), the spatial light modulator (90) for selectively modulating the input image such that at least one portion of the input image may be blurred as it passes through the spatial light modulator (90) toward the image receiving unit (22).
- 5: In regards to Claim 2, Bacs, Jr. et al teaches on Column 5, Lines 41-44 the image receiving unit (22) comprises an array of photodetector cells (CCD array).

Art Unit: 2612

6: As for Claim 3, Bacs, Jr. et al teaches on Column 10, Lines 49-54 and depicts in Figure 8 the spatial light modulator (90) comprises an array of liquid crystal opto-electric elements (92).

7: In regards to Claim 4, Bacs, Jr. et al teaches on Column 10, Lines 49-54 and depicts in Figure 8 the spatial light modulator (90) comprises an array of liquid crystal opto-electric elements (92). These elements are viewed by the examiner to be birefringent elements for selectively effecting a blurring of the input image.

8: As for Claim 5, Bacs, Jr. et al teaches on Column 10, Lines 49-54 that the birefringent characteristics of each birefringent element are selectively controlled independent of other birefringent elements.

9: In regards to Claim 6, Bacs, Jr. et al teaches on Column 10, Lines 49-54 and depicts in Figure 8 the spatial light modulator (90) includes a liquid crystal cell (92).

10: As for Claim 7, Bacs, Jr. et al does not specifically state or depict that the liquid crystal cell (92) is surrounded along its periphery by a plurality of electrodes. However, it is inherent that the spatial light modulator as depicted in Figure 8 contain a plurality of electrodes in order to individually address each of the liquid crystal cells.

11: In regards to Claim 10, Bacs, Jr. et al teaches on Column 12, Lines 38-40 and depicts in Figure 11 the image receiving unit includes a robotic vision system.

12: In regards to Claim 12, Bacs, Jr. et al teaches on Column 10, Lines 33-67 and Column 11, Lines 1-4 and depicts in Figures (1 and 8) an imaging system for selectively blurring portions of an image field, the system comprising: an array of birefringent elements (liquid crystal spatial light modulators (92)) through which the image field may

pass, the birefringent elements (92) being individually selectable to permit selective birefringence of the input image.

13: In regards to Claim 14, Bacs, Jr. et al teaches on Column 10, Lines 33-67 and Column 11, Lines 1-4 and depicts in Figures (1 and 8) an imaging system for selectively blurring portions of an image field, the system comprising: a liquid crystal cell (90) through which the image field may pass; and a plurality of electrodes positioned adjacent the liquid crystal cell such that portions of the liquid crystal cell may be selected to provide birefringence of the image field as the image field is refracted through the liquid crystal cell. Bacs, Jr. et al does not specifically state or depict that the liquid crystal cell (92) is surrounded along its periphery by a plurality of electrodes. However, it is inherent that the spatial light modulator as depicted in Figure 8 contain a plurality of electrodes in order to individually address each of the liquid crystal cells. Bacs, Jr. et al teaches on Column 10, Lines 49-54 and depicts in Figure 8 the spatial light modulator (90) comprises an array of liquid crystal opto-electric elements (92). These elements are viewed by the examiner to be birefringent elements for selectively effecting a blurring of the input image.

14: As for Claim 15, Bacs, Jr. et al teaches on Column 10, Lines 66-67 and Column 11, Lines 1-4 the portions of the liquid crystal cell may be selected to provide a desired amount of birefringence of the image field as the image field is refracted through the liquid crystal cell.

15: Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by USPN 6,021,005 Cathey, Jr. et al.

Art Unit: 2612

16: As for Claim 9, Cathey, Jr. et al teaches on Column 3, lines 36-55, Column 5, Lines 6-15 and Column 6, Lines 46-53 and depicts in Figure 11 an imaging system for receiving images, the system comprising: an image receiving unit (110) for receiving an input image; and a spatial light modulator (106) interposed between the image receiving unit and an input image, the spatial light modulator for selectively modulating the input image such that at least one portion of the input image may be blurred as it passes through the spatial light modulator toward the image receiving unit. Cathey, Jr. et al teaches on Column 6, Lines 46-53 the image receiving unit includes a holographic material.

17: Claims 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 4,575,193 Greivenkamp, Jr.

18: In regards to Claim 16, Greivenkamp, Jr teaches on Column 4, Lines 6-50 and depicts in Figures (1 and 2) an imaging system for receiving images, the system comprising: an image receiving unit (12) for receiving an input image; and a spatial light modulator (14) interposed between the image receiving unit (12) and an input image, the spatial light modulator (14) including a first area (16) for refracting the input image along a principle axis of refraction toward the image receiving unit (12), and a second area (20) for refracting the input image along the principle axis of refraction and along a second axis of refraction, the second axis of refraction being angularly disposed to the first axis of refraction.

19: As for Claim 17, Greivenkamp, Jr teaches on Column 11, Lines 59-68 that Liquid crystal electro-optical materials can be used in which the spatial frequency response of the filter can be changed by changing the voltage across the material this changes the

Art Unit: 2612

birefringence characteristics of the material. Therefore, the imaging system further includes a control unit for varying the angular direction of the second axis of direction with respect to the principle axis of refraction.

20: In regards to Claim 18, Greivenkamp, Jr teaches on Column 4, Lines 6-50 on Column 11, Lines 59-68 and depicts in Figures (1 and 2) an imaging system for receiving images, the system comprising: an image receiving unit (12) for receiving an input image; and a spatial light modulator (14) interposed between the image receiving unit (12) and an input image, the spatial light modulator (14) including a first area (16) for refracting the input image along a principle axis of refraction toward the image receiving unit (12), and along a second axis of refraction, the second axis of refraction being angularly disposed to the first axis of refraction, and a second area (20) for refracting the input image along the principle axis of refraction and along a third axis of refraction, the third axis of refraction being angularly disposed to the first axis of refraction at an angle greater than the angle of the second axis of refraction.

21: As for Claim 19, Greivenkamp, Jr teaches on Column 11, Lines 25-35 that more wave plates and birefringent elements can be used instead of just two. Therefore, the system can further comprise a third area (third birefringent element) for refracting the input image along the principle axis of refraction and along a forth axis of refraction, the forth axis of refraction being angularly disposed to the first axis of refraction at an angle greater than the angle of the third axis of refraction.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2612

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

22: Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by USPN

6,107,617 Love et al.

23: In regards to Claim 8, Love et al teaches on Column 4, Lines 1-15 and depicts in Figure 3 an imaging system for receiving images, the system comprising: an image receiving unit (CCD camera) for receiving an input image; and a spatial light modulator (LC SLM) interposed between the image receiving unit (CCD) and an input image (incoming light), the spatial light modulator (LC SLM) for selectively modulating the input image such that at least one portion of the input image may be blurred as it passes through the spatial light modulator toward the image receiving unit. Love et al teaches the system includes a plurality of spatial light modulators interposed between the input image and the image receiving unit.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24: Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN

5,991,551 Bacs, Jr. et al.

Art Unit: 2612

25: As for Claim 11, Bacs, Jr. et al teaches the invention as discussed in Claim 1.

However, Bacs, Jr. et al does not teach that the image receiving unit includes a visual monitoring system.

Official notice is taken that it was well known in the art at the time the invention was made to include monitors that display captured images (visual monitoring system) in video cameras in order to allow a user to view the captured images.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a monitor in the image receiving system of Bacs, Jr. et al in order to allow a user to view the captured images.

26: Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,991,551 Bacs, Jr. et al in view of USPN 5,453,844 George et al.

27: As for Claim 13, Bacs, Jr. et al teaches a system that uses Liquid crystal spatial light modulators to perform selective blurring of regions of the image. However, Bacs, Jr. et al does not teach that the image blurring is specified by an image compression algorithm.

George et al teaches on Column 3, lines 20-25 that is advantageous in imaging systems to capture blurred images in accordance with a compression operation in order to maintain fidelity of the image and to require less pixels than the original image.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to blur the image of Bacs, Jr et al in accordance with the compression operation of George et al teaches in order to maintain fidelity of the image and to require less pixels than the original image.

Art Unit: 2612

28: Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN

4,575,193 Greivenkamp, Jr in view of USPN 6,107,617 Love et al.

29: In regards to Claim 20, Greivenkamp, Jr teaches the claimed invention as discussed in Claim 18. However, Greivenkamp, Jr does not teach that the spatial light modulator comprises an array of birefringent elements.

Love et al teaches on Column 4, Lines 1-15 and depicts in Figure 3 an imaging system for receiving images, the system comprising: an image receiving unit (CCD camera) for receiving an input image; and a spatial light modulator (LC SLM) interposed between the image receiving unit (CCD) and an input image (incoming light), the spatial light modulator (LC SLM) for selectively modulating the input image such that at least one portion of the input image may be blurred as it passes through the spatial light modulator toward the image receiving unit.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an array of Liquid crystal elements for the Spatial light modulator of Greivenkamp, Jr in order to allow the input image to be selectively blurred on a pixel by pixel basis.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPN 6,636,278 Dultz et al teaches an imaging system with a liquid crystal modulator; USPN 6,771,422 Clark see Figure 1; US 2004/0101168 Kostrzewski et al teaches the use of an imaging system that uses a liquid crystal spatial modulator; USPN 5,555,129 Konno et al teaches an imaging system that uses spatial light modulators; US 2004/0037462 Lewis et al see Figure 1; US 2004/0105100 Shirley.

Art Unit: 2612

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M Hannett whose telephone number is 703-305-7880. The examiner can normally be reached on 8:00 am to 5:00 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James M. Hannett
Examiner
Art Unit 2612

JMH
August 19, 2004

Wendy R. Garber
WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600